DRAFT DOCUMENT

California K-12 Education Technology Master Plan

Developed by the
Commission on Technology in Learning

Approved by the
Commission on Technology in Learning
on December 13, 2002 for submission to the
California State Board of Education
in February 2003

[Copyright page]

Commission Chair: Richard A. Navarro, Ph.D. Dean, College of Education and Integrative Studies, CSU Pomona

Document written by Christina Dehler, Ph.D. and Lara M. Brown, Ph.D.

Prepared in collaboration with the Education Technology Office
Nancy Sullivan, Director, Data Management Division
Mary Sprague, Education Programs Consultant
Brandi Jauregui, Associate Governmental Program Analyst

California Department of Education
Education Technology Office
1430 N Street, Suite 3705
Sacramento, CA 95814
Attention: Ed Tech Master Plan Coordinator
FAX: (916) 323-5110
Email: **ctl@cde.ca.gov**

CTL Web site: **http://www.cde.ca.gov/ctl**

Table of Contents

93

94 **Carlton Jenkins**, Primary Liaison for the State Board of Education

95

96 **David E. Leveille**, Ed.D., Liaison for the California Postsecondary Education
97 Commission

98

99

100 **California Department of Education** staff who contributed to developing the document were:

101

102 **Susie Lange**, Deputy Superintendent, Finance, Technology and Administration Branch

103

104 **Nancy Sullivan**, Director, Data Management Division

105

106 **Mary Sprague**, Education Programs Consultant, Education Technology Office

107

108 **Brandi Jauregui**, Associate Governmental Program Analyst, Education Technology Office

109

110 **Jeanne McKibbon,** Office Technician, Education Technology Office

111

112 **The Following Individuals and Organizations**
113 **Presented at Commission Meetings**

114

115 **Individual Presenters included:**
116 **Sara Armstrong**, Director of Content, The George Lucas Educational Foundation

117

118 **Rowland Baker**, Director, TICAL

119

120 **Shelly Bernard**, District Program Specialist, Technology TEAMatrix coordinator,
121 Hacienda La Puente Unified School District

122

123

124 **David Byer**, Member of the Web-based Commission

125

126 **Rob Darrow**, Library Media Teacher on Special Assignment, Online Learning Specialist.
127 Center for Advanced Research and Technology (CART), Clovis Unified School District

128

129 **Betsy Eaves,** Director K-12 ELA Educational Leadership,
130 Teacher Education and Professional Development, University of California, Office of the
131 President

132

133 **Todd Finnel**, past Director, TechSets

134

135 **Ann Flynn,** Director of Education Technology,
136 National School Boards Association

137

138   **Bridget Foster**, Director, California Learning Resources Network (CLRN)

139   **Glenn Gilbert** of the Joint Committee to Develop a Master Plan for Education – Kindergarten
140   through University (Alternative Modes of Delivery subgroup)

141
142   **John Hodges,** past Director, Computer Using Educators (CUE)
143
144   **Dr. M. G. (Peggy) Kelly,** Professor, College of Education, California State University, San
145   Marcos

146   **Dave Master**, Hugh O. La Bounty Endowed Chair, College of Education and Integrative
147   Studies, California State Polytechnic University, Pomona
148
149   **Gary Quiring,** Education Consulant and liaison for the CTAP[2], Education Technology Office,
150   California Department of Education

151   **Cathy Ringstaff**, Senior Research Associate, WestEd Laboratories

152   **Chris Shultz**, Governor's Office of the Secretary for Education

153
154   **Jean Treiman**, Education Consultant, Professional Development Office, California Department
155   of Education
156
157   **Ellis Vance,** Director, Computer Using Educators (CUE)
158
159   **David Warlick,** Director of the Landmark Project
160
161   **Dr. Yong Zhao**, Michigan State University
162
163
164   **Presentations by Organizations included:**
165   **California Technology Assistance Project (CTAP) Region 9:** Harry Bloom, Director; Susanna
166   Prentice; Todd Finnell
167
168   **Center for Applied Research in Educational Technology (CARET) Project**: John Cradler,
169   Ruthmary Cradler and Molly Freeman
170
171   **California Technology Assistance Project (CTAP),** Directors from various regions
172
173

Executive Summary

173
174
175 An aspiring teacher once told me, "I want to teach because I want to touch the future everyday."
176 She knew what many prefer to ignore; that our future is dependent upon the quality of our
177 educational system and how well prepared our children are to become adults and be productive,
178 contributing citizens. While we succeed in ensuring a promising future for some, we are failing
179 far too many.
180
181 The Commission for Technology in Learning was created out of this concern for closing the
182 achievement gap and providing access for all children to the knowledge and skills required to
183 sustain the growth and prosperity we have come to expect as Californians. AB 598, Soto carried
184 a clear message, technology is basic to a 21st Century educational system, and **all** our children
185 should have access to it. The Commission began first with the development of Technology
186 Planning Guidelines for School Districts. These guidelines prepared with extensive input from
187 state, county and district administrators and technology planning experts provide a rubric for
188 assessing and planning for continually increasing the role of technology in schools. Next, the
189 Commission turned its attention to articulating a vision of education in California in which
190 improving student achievement is intertwined with the growing significance of integrating
191 technology in the teaching and learning process, as well as the administration of schools.
192
193 The proposed Master Plan was guided by five principles. First, that educational technology is
194 both a **tool** for overcoming many of the barriers to learning, particularly among our most
195 challenging educational conditions (i.e., poverty, limited English proficiency, before and after-
196 school activities, literacy and numeracy, limited resources, etc.); AND, that educational
197 technology is a **skill** required for full participation in the workforce and society.
198
199 Second, that technology provides an unprecedented opportunity to completely **redefine the**
200 **learning environment** for all children and adults, inside of school and beyond. Third, that to
201 realize its potential, the technology **must work** and **it has to be accessible anytime, anywhere,**
202 **for all users**. Fourth, that achieving these goals is not just the responsibility of governments, but
203 **the responsibility of all citizens.** The private sector has a particular interest in the success of
204 this endeavor because our success (or failure) will determine the **productivity of our future**
205 **workforce**. And society has an intrinsic interest in the changes proposed because the
206 productivity of its citizens will have a direct effect on the **quality of life for future generations**.
207
208 And, fifth, that there is a general consensus that our children require **more powerful learning**
209 **opportunities to achieve high standards of knowledge and skills,** to be prepared to assume the
210 mantel of leadership in tomorrow's fiercely competitive global society.
211
212 Therefore, we have proposed a Master Plan that will catalyze those actions, which we believe,
213 will help to "tip" the educational system in the direction of harnessing the power we believe
214 exists in technology for the benefit of all our children and society as a whole. Society is slow to
215 catch up with the pace of technological innovation; it is our hope that this Master Plan will
216 contribute to accelerating that process.
217

218   This Master Plan is the result of countless hours of deliberation, debate, and compromise among
219   a very committed group of Commissioners, Department of Education staff, consultants, and
220   many other professionals from both the public and private sectors who care deeply about
221   children and are passionate about the promise of technology for lifting the ceiling on learning.
222   Much of this deliberation occurred in less than ideal circumstances. But, as the State's economy
223   worsened and the resources to support the Commission's work became scarcer, the
224   determination of the Commissioners to complete the task without compromising in the quality or
225   integrity of the plan was strengthened. Fortunately, we were blessed with an equally hard
226   working staff in the California Department of Education, and an extremely talented team of
227   consultants. While the ideas and recommendations are those of the Commissioners, the
228   harmonic prose is the teamwork of Drs. Lara Brown and Christina Dehler. Personally, I have
229   been honored to have had the privilege of working with such an excellent team. If we can claim
230   any inspiration for this plan, it is our collective respect and admiration for the tens of thousands
231   of educators who touch our future everyday. As Californians, we dedicate this Master Plan to
232   the future--California's children.
233

234
235   Richard A. Navarro, Ph.D.
236   Chair
237

238   The Commission on Technology in Learning
239   **Recommended Actions**
240

241   1. The State should study, identify and determine multiple measures for a Technology
242   Integration Performance Index (TIPI) and develop appropriate methods for the collection,
243   analysis, and publishing of the TIPI in the Annual School Accountability Report.
244

245   2. The State should use the TIPI to develop incentives and allocate resources to districts and
246   schools to help them achieve ubiquitous access to rigorous and effective digital content to
247   meet the diverse learning needs of all students.
248

249   3. The State should continue to support, expand, and coordinate technology resources such as,
250   the Digital California Project (DCP) and California Learning Resources Network (CLRN), to
251   gather and promote access to rigorous and effective digital content.
252

253   4. The State Board of Education should revise the K-8 Instructional Materials Adoption process
254   to provide for a more in-depth review of each Electronic Learning Resources (ELR)
255   submitted for adoption, including an assessment of the rigor and effectiveness of the
256   resource. To help educators take advantage of appropriate technology, review results should
257   identify the specific standard(s) addressed by each separate ELR, be posted on the CLRN
258   website, and be searchable by the academic content standards addressed by each resource.
259

260   5. The State should provide incentives to business and industry to develop rigorous and
261   effective digital content in curriculum, instruction, and assessment that are aligned to State
262   Academic Content Standards and take advantage of appropriate technology.
263

264   6. The State should provide incentives to districts and schools to integrate rigorous and
265   effective digital content in curriculum, instruction, and assessment that are aligned to State
266   Academic Content Standards and take advantage of appropriate technology.
267

268   7. The State should develop information and technology literacy standards for all students at
269   every grade level, and as an interim step, may consider the adoption of the International
270   Society for Technology in Education (ISTE) National Education Technology Standards
271   (NETS).
272

273   8. The State should provide incentives to establish and sustain high-quality partnerships and
274   annually recognize exemplary partnerships that develop students' information and
275   technology literacy.
276

277   9. The State should use the TIPI to develop incentives and allocate resources to districts and
278   schools to help them achieve ubiquitous access to rigorous and effective systemic
279   professional development that promotes the integration of technology in education.
280

281   10. The State should provide incentives to districts and schools to foster and sustain rigorous and
282   effective systemic professional development that promotes the integration of technology in
283   education.
284

285   11. The State should provide incentives to business and industry to foster and sustain rigorous
286   and effective systemic professional development that promotes the integration of technology
287   with their education products.
288

289   12. The State should use technology and statewide technology resources to foster and sustain
290   rigorous and effective systemic professional development that promotes the integration of
291   technology in education.
292

293   13. The State should provide incentives that fairly compensate educators who show leadership by
294   developing technology innovations and transfer the intellectual property rights to the State,
295   thereby, placing the innovations in the public domain.
296

297   14. The State should provide incentives to enhance K-12 collaboration with higher education,
298   business and industry, nonprofits and community-based organizations to use technology
299   across the professional development continuum (teacher education through accomplished
300   teaching).
301

302   15. The State should provide incentives to districts and schools that encourage educators to use
303   data to inform reflective practice and guide continuous improvement; and frequently publish
304   those exemplary applications of data-driven decision-making.
305

306   16. The State should provide incentives to high-quality partnerships and annually recognize
307   exemplary partnerships that deliver professional development focused on reflective practice
308   and continuous improvement.
309

310   17. The State should use the TIPI to develop incentives and allocate resources to districts and
311   schools to help them achieve ubiquitous access for all students and educators.
312

313   18. The State should explore providing learning opportunities that use technology to promote
314   State Academic Content Standards and qualify for average daily attendance (ADA) funding,
315   allowing for greater flexibility with categorical funding and resources.
316

317   19. The State should require districts and schools to incorporate the total cost of ownership
318   model as a prerequisite to receiving new educational technology funding.
319

320   20. The State should be required to review and update the District Planning Guidelines as
321   necessary.
322

323   21. The State should provide incentives to high-quality partnerships and annually recognize
324   exemplary partnerships that foster innovation and sustain technology acquisition and
325   integration.
326

327 22. The State should develop incentives that promote the coordination of existing education
328   policy and resources for technology acquisition and integration.
329
330 23. The State should encourage local flexibility to allow categorical funds and Lottery funds to
331   be used for technology acquisition and integration.
332
333 24. The State should provide support and assistance to districts and schools to help them collect
334   and use data to make better-informed decisions.
335
336 25. The State should use technology to coordinate state efforts to collect, secure, analyze, plan,
337   and annually publish data related to technology integration and its impact on district, school,
338   and student improvement.
339

Closing the Gaps Matrix	**Curriculum, Instruction, & Assessment**	**Professional Development**	**Infrastructure**
Ubiquitous Access	1, 2	1, 9	1, 17
Educational Technology	1, 3, 4, 5	1, 10, 11, 12, 13, 14, 15, 16	1, 18, 19, 20, 21, 22, 23, 24, 25
Technology Integration	1, 6, 7, 8	1, 10, 11, 12, 13, 14, 15, 16	1, 18, 19, 20, 21, 22, 23, 24, 25

340
341
342
343
344
345
346
347
348
349
350

Vision for California: Closing the Gaps

Closing the gaps in access to technology that enhance and enable teaching, learning and leadership, will help all students achieve mastery of the State Academic Content Standards throughout California, providing students a future of choices and a choice of futures.

California's global economic future increasingly depends on California's educational system. California currently ranks as the world's fifth largest economy, yet despite significant interest and improvement in recent years, California's K-12 educational system still ranks below most other states on key educational benchmarks including, spending and student achievement.[1]

The Commission on Technology in Learning (CTL) recognizes the need for California's educational system to improve, and it is the hope of the CTL that the recommendations in this report will ensure that **technology** is systemically integrated into all levels of education. The CTL believes that California has the opportunity to reemerge as a national educational leader by investing in our schools and working with educators[2] to integrate the technologies that will enhance and enable teaching, learning, pedagogy, and school management.

Education continues to be an issue of concern and a high investment priority for Californians.[3] The CTL believes that educational technology policy initiatives and funding at the state level should be aligned to recognize student achievement, educational leadership, and school improvement. Moreover, these initiatives and funding allocations should be designed to provide consistency, stability, and transparency to educators and the public. The policy environment at the state level must facilitate the ability of educators at both districts and schools to use technology to ensure that all students achieve mastery of the State Academic Content Standards at every grade level. The Commission recognizes that these educational goals cannot be achieved through state action and support alone. Thus, the CTL calls on those from higher education, business and industry, and nonprofit and community organizations to assist educators and policymakers to improve and further **technology integration** in California schools.[4]

The Commission on Technology in Learning believes that educational technology, equitably distributed and appropriately applied, enhances and enables student learning, innovative teaching, professional development, school management, **data-driven decision-making,** and collaboration across the education spectrum.

---

[1] Howell, Penny and Miller, Barbara. 2001. "How California Ranks: A Comparison of Education Expenditures," *EdSource*, October issue, p. 1-8.

[2] Refers to all teachers, administrators, and school staff. This is in keeping with the organizational learning literature that discusses the importance of everyone involved in a system (Senge, 2000).

[3] (Find & Cite public opinion poll to support this statement)

[4] Throughout the document, key terms will be highlighted and defined in Appendix I.

Nature and Purpose of the Education Technology Master Plan

390
391
392 The purpose of the Education Technology Master Plan is to provide a vision for the state on how
393 to effectively use and support educational technology to improve student achievement, close the
394 gaps in access to educational technology, and move California schools to at least parity with or
395 exceed the level of technology integration in other states.
396
397 The Education Technology Master Plan sets forth goals and recommendations for state
398 policymakers to help educators attain higher levels of educational technology integration by the
399 year 2008. Achieving higher levels of educational technology integration will close the gaps in
400 access to improved curriculum, instruction, and assessment; professional development; and
401 infrastructure statewide.
402
403

Progress Towards the 1996 Plan: Connect, Compute, and Compete

405
406 Progress has been made towards the goals of the 1996 California Education Technology Master
407 Plan (*Connect, Compute, and Compete*). The 1996 Plan was intended to assess the current state
408 of technological readiness in California's classrooms and libraries and to serve as a blueprint for
409 action. It recommended building the technology capacity in California's schools, so that by the
410 year 2000, California would have met the following objectives:
411
412   •   A student-to-computer ratio of four to one;
413   •   Telecommunications access for students in every classroom and library;
414   •   Technology as an integral resource for all students and teachers; and
415   •   Reading and math scores above the 50th percentile nationally.
416
417 Despite significant effort and commitment, at both the State and regional levels, the lack of
418 overall educational technology funding, and the lack of priority educational technology has
419 received relative to other educational needs among state policymakers have been the primary
420 impediments to reaching the 1996 objectives. The current economic downturn continues to
421 adversely affect the state's progress because of the high-cost nature of educational technology
422 integration into curriculum and assessment, including the need for professional development and
423 hardware acquisition. In addition, many schools in California have complex infrastructure
424 needs, including those related to telecommunications and electrical requirements, which have
425 also served as impediments to the successful implementation of the educational technology goals
426 set forth in 1996.
427
428 While the educational technology goals set in 1996 have not yet been achieved, the gains have
429 been impressive, especially with respect to the ratio of students to computers and Internet access
430 in classrooms. The California Technology Assistance Project (CTAP) *Summary of Year 2002*
431 *School Technology Survey Findings: California Statewide Report*, found that 96% of schools
432 were connected to the Internet in 2002, and that telecommunication access in the classroom has
433 broadened across the state with the average school providing connections to the Internet in 84%
434 of its classrooms (up from 58% two years earlier). Additionally, the student-to-computer ratio (a
435 common measurement of student access to computers) has made steady improvement, declining

436   to a ratio of 5.3 to one in 2002. Another measurement of student access to technology is the ratio
437   of students-to-multimedia computers (which include computers with internet access capability).
438   During 2002, this ratio was 9.10 to one; however, because the definition for multimedia
439   computers changed in 2002 for purposes of the survey, reliable trend data is not available.
440

441   ***Connectivity & Access***

442
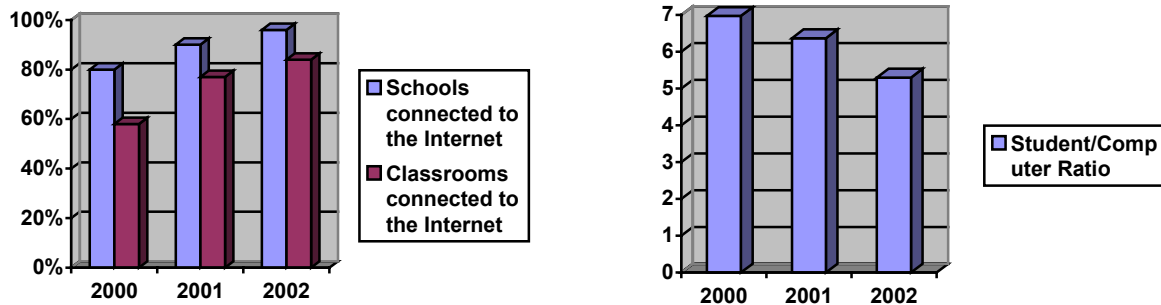
443   With recent efforts at the state level to fund the implementation of comprehensive technology
444   programs, such as the Digital High School Program, California schools have made significant
445   gains in connectivity and access to technology. High schools reportedly provide students with
446   access to more technology than at the other grade levels, with 99% of high schools in the state
447   connected to the Internet, 94% of their classrooms connected, and a student to computer ratio of
448   4.1 to one. It is only through sustained, ongoing efforts such as the Digital High School Program
449   that effective technology integration can take place.

450

451   Conversely, the survey findings provide a clearer picture of how well technology in our schools
452   is supported at the district and site levels. Survey results indicate that although schools are
453   acquiring more computers and high-speed connections to the Internet, there is a clear lack of
454   personnel to provide technical support and training to help teachers integrate educational
455   technology with instruction. In 2002, 62% of schools had no certificated personnel to provide
456   technical support and 45% of schools had no classified personnel to provide technical support.
457   Additionally, 33% of schools had to wait more than a week (but less than a month) for hardware
458   repairs, making it more difficult to utilize technology on a regular basis for instruction. Support
459   and training for the integration of computer technology into daily lesson planning has emerged as
460   a critical area in recent years. In 2002, 50% of schools had no certificated staff at the school site
461   to provide the necessary curriculum support.

462

463   All students should have access to state of the art technology and rigorous and effective **digital**
464   **content**. Although the "digital divide" gap is closing, California schools still struggle with
465   digital inequities. Despite the state's efforts, students living in poverty continue to have less
466   access to better technology. Survey results indicate that students attending the "richest" schools
467   in California (those with the lowest poverty levels) have a student-to-computer ratio of 4.74, as
468   compared to a ratio of 6.13 for the poorest schools (those with the highest levels of poverty).
469   Also, schools with high poverty levels reported fewer classrooms connected to the Internet
470   (80%) as compared to schools with low poverty levels (93%).

471

472

473 ***Connectivity & Access by Measures of Poverty – Free and Reduced Priced Lunch (FRPL)***

474
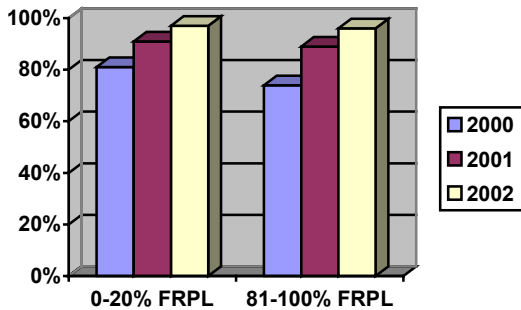
Schools Connected to the Internet   *Classrooms Connected to the Internet*

Student to Computer Ratio

475
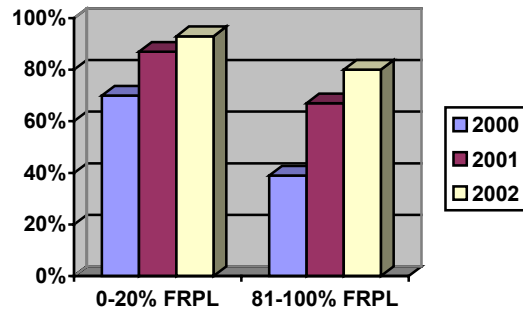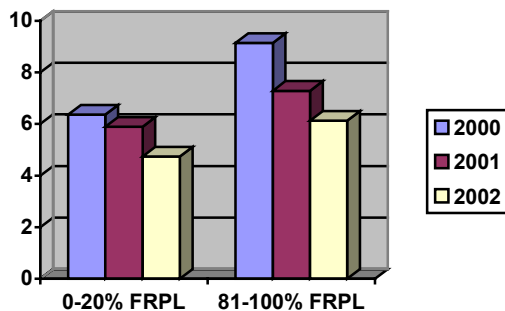
476   Federal educational technology programs, such as the E-rate program and the Technology

477 Literacy Challenge Grant Program, have made efforts to target high poverty schools and the data

478 shows marked improvements in access and connectivity in even the poorest schools as compared

479 to two years ago. In the last two years, the number of high poverty schools connected to the

480 Internet increased from 74% to 96%, which almost equals the same percentage as for the

481 "richest" schools (97% in 2002). Also, the number of classrooms connected to the Internet for

482 the poorest schools, made significant gains, increasing from 39% to 80%.

483

484   As California plans for the future, policymakers must recognize the technology investment that

485 the state has made in our schools and understand that the recommendations in this report aim to

486 maximize that investment by putting the power of technology into the hands of all teachers,

487 students, and administrators.

488

489

489
490 **Looking Forward**
491
492 The Commission on Technology in Learning is committed to the integration of technology in
493 education to enable and enhance the ability of educators at both the district and school site to
494 improve student achievement.
495
496 Recognizing that technology will change over the next five years, the CTL encourages the state
497 to support local flexibility in the integration of technology. It is important to allow educators
498 flexibility to ensure that technology is used appropriately to meet the needs of all students. The
499 CTL believes that the state must consistently support and align education policy to promote the
500 integration of technology throughout California.
501
502 In recent years, California passed legislation that has furthered the integration of technology in
503 education. Programs such as, Digital High Schools, have benefited students throughout
504 California and should continue to be supported by policymakers. Current statewide technology
505 resources such as the Digital California Project (DCP), California Student Information System
506 (CSIS), California Learning Resource Network (CLRN), California Technology Assistance
507 Project (CTAP), Technology Information Center for Administrative Leadership (TICAL),
508 Technical Support for Education Technology in Schools (TechSETS), and the California Teacher
509 Technology Assessment Project CTAP^2 [5], have also played a significant role in California's
510 technology integration and need to continue to be supported and expanded to better serve the
511 needs of the districts, schools, and educators throughout the state.
512
513 The Commission on Technology in Learning recommends that the state continue to develop the
514 possibilities of the Digital California Project to ensure the availability of the network to all
515 schools and to realize effective uses for the newly completed network (multi-dimensional
516 aspect). The Commission also recommends that the state focuses on the coordination and
517 efficient use of resources and explores the possibilities for furthering data-driven decision-
518 making processes at all levels. Consistency and alignment of policy and funding at the state and
519 local levels are critical for California to improve educational technology integration to assist all
520 students in achieving California's State Academic Content Standards.
521
522 The Commission on Technology in Learning gathered[6] case studies to demonstrate the variety of
523 ways technology is integrated in education to improve curriculum, instruction, assessment,
524 professional development, and school management.
525
526 • ***Ubiquitous Access***
527 Closing the gaps in access to educational technology for students and
528 educators will help all students achieve the State Academic Content
529 Standards. Ubiquitous access will ensure that student and educator work is
530 neither impeded, nor restricted to the school or district site. Districts and

---

[5] These statewide technology resources are defined in Appendix VII.
[6] The California Department of Education's Technology Office distributed a "Call for Case Studies" to the CTAP Regional Directors and solicited information from projects discussed during the Commission Meetings.

531		schools have approached providing ubiquitous access differently in their local
532		communities, for example:
533		
534		*Case Studies to be Inserted Here*
535		
536		
537	•	***Curriculum, Instruction, and Assessment***
538		Closing the gaps in access to rigorous and effective digital content will help
539		all students and educators to be both users and producers of academic content
540		and innovative curriculum and assessment, furthering efforts to ensure that all
541		students achieve State Academic Content Standards. Districts and schools
542		have created and utilized an assortment of rigorous and effective digital
543		content ranging from commercial software to educator developed materials,
544		for example:
545		
546		*Case Studies to be Inserted Here*
547		
548	•	***Professional Development***
549		Closing the gaps in access to systemic professional development will ensure
550		the integration of educational technology into curriculum, pedagogy, and
551		school management. Districts and schools have developed different programs
552		for delivering technology training, for example:
553		
554		*Case Studies to be Inserted Here*
555		
556	•	***School Management***
557		Closing the gaps in access to professional development focused on school
558		management and educational technology integration; to district, school, and
559		student data; and to the educational technology that facilitates procedures and
560		processes, and provides analytical feedback will ensure effective and efficient
561		school management. Districts and schools have addressed improving school
562		management differently, for example:
563		
564		*Case Studies to be Inserted Here*
565		
566	•	***Assistive Technology***
567		Closing the gaps in access to assistive technology will ensure that all students,
568		including English language learners, and those with disabilities and special
569		needs achieve State Academic Content Standards. Assistive technology
570		allows educators to develop individualized learning programs to meet the
571		needs of all students. Different technologies exist to help all students meet
572		their learning needs, for example:
573		
574		*Case Studies to be Inserted Here*
575		

575
576   • ***Higher Education, Business, and Community Partnerships***
577   __**High-quality partnerships**__ will help districts and schools close the gaps in
578   curriculum, professional development, and infrastructure. Partnerships with
579   higher education institutions, businesses, and community organizations
580   provide districts and schools opportunities to leverage resources and expertise
581   to promote the integration of technology in education. Districts and schools
582   have developed various types of partnerships, for example:
583
584   *Case Studies to be Inserted Here*
585
586   Goals and Recommendations
587
588   ***Vision for California: Closing the Gaps***
589
590   *Closing the gaps in access to technology that enhance and enable teaching, learning and*
591   *leadership, will help all students achieve mastery of the State Academic Content Standards*
592   *throughout California, providing students a future of choices and a choice of futures.*
593
594   Recommended Action:
595   1. The State should study, identify and determine multiple measures for a
596   **Technology Integration Performance Index (TIPI)** and develop appropriate
597   methods for the collection, analysis, and publishing of the TIPI in the Annual
598   School Accountability Report.
599
600
601   ***Curriculum, Instruction, and Assessment: Ubiquitous Technology and Mastery of Academic***
602   ***Standards***
603
604   *Closing the gaps in access to rigorous and effective digital content aligned to the State Academic*
605   *Content Standards and fully integrated into curriculum, instruction, and assessment will help*
606   *ensure that all students are prepared to meet the present and future needs of California.*
607
608   • **Equity and Access**
609
610   Goal: All students and educators will have __**ubiquitous access**__ and the ability to utilize
611   rigorous and effective digital content.
612
613   Rationale: Technology may be used effectively to facilitate the distribution and broaden
614   the delivery of rigorous and effective digital content throughout California. The digital
615   divide that stretches across many communities is not only related to hardware and
616   connectivity, but also to rigorous and effective digital content. Traditionally, students in
617   the least advantaged schools also have had the least access to rigorous and effective

618   digital content.[7] Closing this knowledge gap requires the state to ensure that rigorous and
619   effective digital content is accessible and utilized by all students and teachers to assist
620   students in meeting and exceeding the State Academic Content Standards. Importantly,
621   technology allows all students, including English language learners and those with
622   special needs, the opportunity to participate fully in education. Ensuring equity and
623   access to rigorous and effective digital content allows students and teachers to be both
624   users and producers of academic content and innovative curriculum and assessment,
625   furthering efforts to improve student achievement.
626
627   Recommended Actions:
628   2. The State should use the TIPI to develop incentives and allocate resources to
629   districts and schools to help them achieve ubiquitous access to rigorous and
630   effective digital content to meet the diverse learning needs of all students.
631   3. The State should continue to support, expand, and coordinate technology
632   resources such as, the DCP and CLRN, to gather and promote access to
633   rigorous and effective digital content.
634
635   Target Tech Indicators:
636   ➢ 100% of students and educators have ubiquitous access to rigorous and
637   effective digital content to meet the diverse learning needs of all students.
638   ➢ Digital content is seamlessly integrated and used by 100% of students and
639   educators on a daily basis in all classes and subjects.
640   ➢ 100% of students have anytime, anywhere access to online course units to
641   supplement and expand course offerings.
642
643   • **Standards**
644
645   Goal: All educators will fully integrate into their practice appropriate educational
646   technology and rigorous and effective digital content to promote mastery of the State
647   Academic Content Standards by all students.
648
649   Rationale: Educational technology and digital content, aligned to State Academic
650   Content Standards, enable students and teachers to address individual learning needs
651   (e.g., age, disabilities, ability level, special needs) using multiple approaches to rigorous
652   and effective content. Learning flexibility increases the opportunities for all students to
653   achieve mastery of the State Academic Content Standards. Educational technology
654   promotes this flexibility, along with collaboration, innovation, applied and contextual
655   learning, and has been shown to increase student achievement.[8] Moreover, educational
656   technology makes possible data collection, analysis and real-time assessment of learning,

---

[7] *Summary of Statewide Results for the 2001California Technology; Summary of Statewide Results for the 2002 California School Technology Survey;* Macias, Julia; Montes, Ana; and Cibran, Alma. 2001. "Connecting California's Children: Is E-Rate Enough?" in *Latino Issues Forum*, July issue, p.1-28.
[8] Ringstaff, Cathy. (Date needed). *Survey of Existing Evaluations on the Impact of Education Technology on Teaching and Learning.* WestEd.; Branigan, Cara. 2002. "Missouri's Ed-Tech Program Is Raising Student Achievement," in *eSchool News*, March 13.

657	all of which provide educators with necessary feedback loops that assist in identifying
658	and targeting the individual learning needs of students.
659	
660	Recommended Action:
661	4. The State Board of Education should revise the K-8 Instructional Materials
662	Adoption process to provide for a more in-depth review of each Electronic
663	Learning Resources (ELR) submitted for adoption, including an assessment of
664	the rigor and effectiveness of the resource. To help educators take advantage
665	of appropriate technology, review results should identify the specific
666	standard(s) addressed by each separate ELR, be posted on the CLRN website,
667	and be searchable by the academic content standards addressed by each
668	resource
669	5. The State should provide incentives to business and industry to develop
670	rigorous and effective digital content in curriculum, instruction, and
671	assessment that are aligned to State Academic Content Standards and take
672	advantage of appropriate technology.
673	6. The State should provide incentives to districts and schools to integrate
674	rigorous and effective digital content in curriculum, instruction, and
675	assessment that are aligned to State Academic Content Standards and take
676	advantage of appropriate technology.
677	
678	Target Tech Indicators:
679	➢ 100% of curriculum and assessment incorporate rigorous and effective digital
680	content that is aligned to state academic standards and takes advantage of
681	appropriate technology.
682	➢ 100% of students and educators utilize curriculum and assessment that
683	incorporate rigorous and effective digital content that is aligned to state
684	academic standards and takes advantage of appropriate technology.
685	➢ 100% of educators utilize CLRN to assist in developing lesson plans that
686	incorporate rigorous and effective digital content, integrate state academic
687	standards, and take advantage of appropriate technology.
688	
689	• **Information & Technology Literacy**
690	
691	Goal: All students will develop information and technology literacy skills[9] that enable
692	them to meet and exceed the demands for an information and technologically literate
693	workforce.
694	
695	Rationale: The knowledge economy age requires that workers be information-literate, "a
696	person must be able to recognize when information is needed and have the ability to
697	locate, evaluate, and use effectively the needed information."[10] Workers must also have
698	knowledge of and proficiency with numerous technologies (e.g., hardware, programs,

---

[9] International Society for Technology in Education includes a set of skills as a part of their NETS and the full list is included in Appendix VI: ISTE NETS.

[10] *American Library Association Presidential Committee on Information Literacy.* Chicago: American Library Association, 1989.

699 applications) and the vast resources available through the Internet and the World Wide
700 Web. (Need to include reference to the Secretary's Commission on Achieving Necessary
701 Skills (SCANS) Report)Students who are the workers of tomorrow must learn to develop
702 the skills that will enable them to use the technological tools available and to understand
703 the information gleaned and analyzed by the technology. Ensuring students develop
704 **information and technology literacy** will help to ensure the state's economic
705 competitiveness in the 21st Century.
706
707   Recommended Action:
708   7. The State should develop technology literacy standards for all students at
709   every grade level, and as an interim step, may consider the adoption of ISTE
710   National Education Technology Standards (NETS).
711   8. The State should provide incentives to establish and sustain high-quality
712   partnerships and annually recognize exemplary partnerships that develop
713   students' information and technology literacy.
714
715   Target Tech Indicators:
716   ➢ 100% of information literacy skills are embedded in and assessed by the State
717   Academic Content Standards[11]
718   ➢ 100% of high-quality partnerships develop student mastery of information and
719   technology literacy skills.
720
721
722 *Professional Development: Systemic Reforms and Continuous Improvement*
723
724 *Closing the gaps in access to systemic professional development that encourages leadership,*
725 *collaboration, and continuous improvement will ensure ubiquitous technology integration in*
726 *education that supports the present and future needs of California.*
727
728   • **Equity and Access**
729
730   Goal: All educators will have access to rigorous and effective systemic professional
731   development that promotes the integration of technology in education.
732
733   Rationale: Technologies may be used effectively to facilitate the distribution and
734   broaden the delivery of rigorous and effective professional development across the state.
735   The opportunity to develop professionally must be equally accessible to all educators.
736   Improving upon and learning new methods for technology integration will bring about
737   systemic reform in curriculum, assessment, pedagogy, and school management.
738
739   Recommended Actions:
740   9. The State should use the TIPI to develop incentives and allocate resources to
741   districts and schools to help them achieve ubiquitous access to rigorous and
742   effective systemic professional development that promotes the integration of
743   technology in education.

---

[11] See Appendix V.

744
745   Target Tech Indicators:
746   ➢ 100% of educators have ubiquitous access to rigorous and effective systemic
747   professional development that promotes the integration of technology in
748   education.
749   ➢ 100% of educators' release time is compensated for rigorous and effective
750   systemic professional development that promotes the integration of
751   technology in education.
752
753
754
755   **• Systemic Professional Development**
756
757   Goal: All educators will receive the training, resources and support necessary to
758   appropriately and effectively integrate technology into curriculum, assessment,
759   pedagogy, and school management.
760
761   Rationale: Capacity building in the profession and reform in education requires that all
762   educators participate in **systemic professional development** programs that support the
763   integration of technology. Educators' varying technology proficiencies require a
764   professional development model that evolves as technical skills increase. This
765   professional development model should be systemic, comprehensive, and include fully
766   supported training that is scaffolded according to individual needs, providing
767   opportunities for one-on-one interaction, workplace and classroom support, and on-line
768   instruction. This model should also include daily or weekly training to meet technical
769   and pedagogical needs, as well as annual or semi-annual intensive training to learn new
770   applications and pedagogical strategies. Most important, educators need time to
771   participate in training programs, develop their newly learned skills, and apply them into
772   their practice. Systemic professional development for technology integration must be
773   fully supported at the state, district, and school level.
774
775   Recommended Action:
776   10. The State should provide incentives to districts and schools to foster and
777   sustain rigorous and effective systemic professional development that
778   promotes the integration of technology in education.
779   11. The State should provide incentives to business and industry to foster and
780   sustain rigorous and effective systemic professional development that
781   promotes the integration of technology with their education products.
782   12. The State should use technology and statewide technology resources to foster
783   and sustain rigorous and effective systemic professional development that
784   promotes the integration of technology in education.
785
786   Target Tech Indicators:
787   ➢ 100% of professional development is systemic and promotes the integration of
788   technology in education, and uses technology to deliver rigorous and effective
789   training, mentoring, and support to educators statewide.

790   ➢ 100% of educators use and integrate rigorous and effective digital content into
791   their practice.
792

793 • **Leadership and Collaboration**
794

795 Goal: All educators will engage in **<u>professional activities</u>** that develop rigorous and
796 effective digital content, integrate technology in education, and promote leadership and
797 collaboration across the education profession.
798

799 Rationale: Educators need to be actively working together to create, share, and scale best
800 practices, rigorous and effective digital content and effective uses of technology
801 integration. Technology provides educators the opportunity to work collaboratively,
802 independent of location, to develop and disseminate exemplars of technology integration
803 into curriculum, instruction, assessment, pedagogy, and school management. Educators
804 need to develop leadership skills that encourage the systemic production, evaluation, and
805 application of digital content, and support the use of technology in schools. Educators
806 also need to serve as models and mentors, to sustain a positive professional culture of
807 continuous improvement and a system of opportunity for professional development that
808 makes use of all available resources at the local, state, and national level.
809

810   Recommended Action:
811   13. The State should provide incentives that fairly compensate educators who
812   show leadership by developing technology innovations and transfer the
813   intellectual property rights to the State, thereby, placing the innovations in the
814   public domain.
815   14. The State should provide incentives to enhance K-12 collaboration with
816   higher education, business and industry, nonprofits and community-based
817   organizations to use technology across the professional development
818   continuum (teacher education through accomplished teaching).
819

820   Target Tech Indicators:
821   ➢ 100% of districts and schools offer systemic professional development,
822   perhaps in partnerships, which cultivate leadership skills and encourage
823   experimentation with the effective uses of technology.
824   ➢ 100% of districts and schools provide opportunities for educators to engage in
825   collaborative activities focused on technology integration.
826

827

828 • **Continuous Improvement**
829

830 Goal: All educators will participate in systemic professional development activities that
831 encourage reflective practices and use technology to continuously improve curriculum,
832 assessment, pedagogy, and school management.
833

834 Rationale: Systemic professional development must encourage reflective practice, data-
835 driven decision-making processes, and continuous improvement in education. Educators

836   need to be actively working to continually improve their use of technology in order to
837   improve teaching, learning and school management. Reflective practice requires that
838   educators be knowledgeable of current research and application, develop mechanisms
839   that provide feedback, and work to continually improve their skills. Educators must also
840   use data to make better-informed decisions about the appropriate and effective uses of
841   technology.

842

843   Recommended Action:

844   15. The State should provide incentives to districts and schools that encourage
845   educators to use data to inform reflective practice and guide continuous
846   improvement; and frequently publish those exemplary applications of data-
847   driven decision-making.
848   16. The State should provide incentives to high-quality partnerships and annually
849   recognize exemplary partnerships that deliver professional development
850   focused on reflective practice and continuous improvement.

851

852   Target Tech Indicators:
853   ➢ 100% of districts and schools offer systemic professional development that
854   teaches data-driven decision-making skills and encourages the use of
855   technology for continuous improvement.
856   ➢ 100% of districts and schools make use of state of the art technology to
857   continuously improve curriculum, assessment, pedagogy, and school
858   management.

859

860

861   *Infrastructure: Ubiquity, Sustainability, and Dynamic Design*

862

863   *Closing the gaps in anytime, anywhere access for all students and educators; promoting*
864   *sustainability and comprehensive planning; and leveraging resources and education data will*
865   *ensure a dynamic technological infrastructure that supports the present and future needs of*
866   *California.*

867

868

869   • **Equity and Access**

870

871   Goal: All students and educators must be able to access and utilize all necessary and
872   appropriate technology resources anytime, anywhere.[12]

873

874   Rationale: Large inequities exist and persist in anytime, anywhere access to operable,
875   reliable, and assistive technology for all students and educators across all communities in
876   California. There are significant technological infrastructure challenges statewide, some
877   impacting rural and urban districts, others affecting schools and their communities.
878   Moreover, ubiquitous access to and reliable operability of assistive technology ensure
879   that the learning needs of all students are met in an appropriate and timely manner.

880

---

[12] For a further definition of anytime, anywhere access, refer to the Target Tech Level provided in the CEO Forum StaR Charts in Appendix II.

880
881   Recommended Action:
882   17. The State should use the TIPI to develop incentives and allocate resources to
883   districts and schools to help them achieve ubiquitous access for all students
884   and educators.
885   18. The State should explore providing learning opportunities that use technology
886   to promote State Academic Content Standards and qualify for average daily
887   attendance (ADA) funding, allowing for greater flexibility with categorical
888   funding and resources.
889
890   Target Tech Indicators:
891   ➢ 100% of students and educators have ubiquitous access and can utilize all
892   necessary and appropriate technology.
893   ➢ 100% of districts and schools have greater flexibility with categorical funds
894   and the allocation of resources to promote learning opportunities using
895   technology.
896
897   • **Sustainability and Comprehensive Planning**
898
899   Goal: All districts and schools must engage in comprehensive technology planning,
900   incorporating **total cost of ownership** into annual budget processes, and design
901   infrastructure for sustainability and optimal utilization of present and future technology.
902
903   Rationale: Designing infrastructure for sustainability and optimal utilization means that
904   technology cannot be treated as a stand-alone or a one-time cost in state, district, and
905   school budgets. Sustainability requires that the technology infrastructure be scalable,
906   reliable, upgradeable, and interoperable across the entire education system in California.
907   As with other infrastructure costs, technology has several components, including
908   technical support, maintenance, replacement, recycling, and disposal. Building
909   infrastructure and acquiring technology requires state and local policymakers, educators,
910   and education partners (businesses and nonprofit organizations) to employ a total cost of
911   ownership model in their technology planning and budgeting. The State should
912   encourage districts and schools to seek out new and leverage existing resources to design
913   for sustainability and optimal utilization of technology.
914
915   Recommended Actions:
916   19. The State should require districts and schools to incorporate the total cost of
917   ownership model as a prerequisite to receiving new educational technology
918   funding.
919   20. The State should be required to review and update the District Planning
920   Guidelines as necessary.
921   21. The State should provide incentives to high-quality partnerships and annually
922   recognize exemplary partnerships that foster innovation and sustain
923   technology acquisition and integration.
924

924
925   Target Tech Indicators:
926   ➢ 100% of districts and schools incorporate the total cost of ownership model in
927   their budgeting and planning for technology.
928   ➢ 100% of districts and schools have technical support available twenty-four
929   hours a day and seven days a week.
930

931 • **Leveraging Existing Resources**

932

933   Goal: All policymakers and educators must collaborate to promote flexibility with
934   existing state technology tools, funding mechanisms, and additional resources to
935   coordinate and develop a sustainable, ubiquitous, and dynamic technology infrastructure.

936

937   Rationale: At all levels policymakers and educators need greater flexibility to leverage
938   and coordinate existing resources to ensure a sustainable, ubiquitous, and dynamic
939   infrastructure (e.g., how funds and building spaces are used and allocated for technology
940   integration). With increased flexibility, there is a need to design policy that improves
941   accountability in the area of technology integration emphasizing outcomes and not inputs
942   (e.g., student achievement and administrative efficiency, and not categorical funding).
943   Moreover, the state has invested significantly in the use of technology by creating
944   resources such as a statewide network, a technical assistance support structure, a
945   curriculum tool, professional development and resources for administrators and
946   technology staff, and a student data and record-keeping system. These technology tools
947   provide tremendous benefit to educators and can be further developed and better
948   coordinated to realize their potential. The State must continue its support of these
949   programs and work to structure policy incentives to encourage local policymakers and
950   educators to collaborate and leverage these and other resources.

951

952   Recommended Action:
953   22. The State should develop incentives that promote the coordination of existing
954   education policy and resources for technology acquisition and integration.
955   23. The State should encourage local flexibility to allow categorical funding and
956   Lottery Funds to be used for technology acquisition and integration.

957

958   Target Tech Indicators:
959   ➢ 100% of districts and schools utilize state resources and work to coordinate
960   local technology decisions with regional and statewide education
961   opportunities for technology acquisition and integration.
962   ➢ 100% of districts and schools have flexibility to leverage their resources and
963   reallocate funding for technology acquisition and integration.

964

965 • **Collecting, Storing, Using, and Securing Data**

966

967   Goal: All policymakers, educators, students, and parents will have anytime, anywhere
968   access to appropriate and necessary data that is securely collected and stored to help them
969   make better-informed decisions related to educational technology integration.

970

971   Rationale: Technology may be used effectively to facilitate the collection and
972   distribution of educational data and broaden the understanding of policymakers,
973   educators, students, and parents to help them make better-informed decisions. There is a
974   need for better student data at all levels, so that policymakers, educators, students, and
975   parents will be able to assess and determine the educational effectiveness of their actions
976   and decisions. While there are security and privacy issues related to record keeping,
977   there are also sufficient technological safeguards that can secure student data. The State
978   must support the secure coordination, collection, analysis, planning, and publishing of
979   district, school, and student data in order to accurately assess educational improvement.
980

981

982   Recommended Actions:
983   24. The State should provide support and assistance to districts and schools to
984   help them collect and use data to make better-informed decisions.
985   25. The State should use technology to coordinate state efforts to collect, secure,
986   analyze, plan, and annually publish data related to technology integration and
987   its impact on district, school, and student improvement.
988

989   Target Tech Indicators:
990   ➤ 100% of districts and schools collect and use data relevant to technology
991   integration and its impact on curriculum, assessment, pedagogy, and school
992   management to make better-informed decisions.
993   ➤ All education stakeholders have the necessary and appropriate data available
994   to them through the State to help them better understand the educational
995   effects of technology on curriculum, assessment, pedagogy, and school
996   management.
997

	Appendix I: Definitions of terms used in plan
997	
998	

997 **Appendix I: Definitions of terms used in plan**

998

999 *Data-driven decision-making*: A process where educators use a variety of district, school,
1000 educator, student, and community data to make better-informed decisions about how to
1001 improve technology use, acquisition, and integration in education.

1002

1003 *Digital content*: The digitized multimedia material that calls upon students to seek and
1004 manipulate information in the collaborative, creative and engaging ways, which make digital
1005 learning possible. It includes video on demand, software, CD-ROMs, websites, e-mail,
1006 online learning management systems, computer simulations, streamed discussions, data files,
1007 databases, audio, and all other digital applications and devices.

1008

1009 *Educational technology:* The methods and materials employed to assist teaching, learning,
1010 and school management, and includes hardware, software, programs, applications, and all
1011 digital content.

1012

1013 *High-quality partnerships:* Collaborative agreements that are beneficial to all parties and
1014 occur between districts and schools with institutions of higher education, businesses, and
1015 nonprofits and community-based organizations, which address various educational needs.

1016

1017 *Information literacy*: The ability to locate, access, evaluate and effectively use information as
1018 needed from a variety of sources.

1019

1020 *Professional activities*: Includes all activities relating to training, mentoring, conference
1021 presentations, research, publishing, materials development and evaluation, and participation
1022 in and contributions to projects such as the Digital California Project (DCP), the California
1023 Learning Resource Network (CLRN) and other online resources.

1024

1025 *Rigorous and effective: (insert definition)*

1026

1027 *Systemic professional development*: A model for professional development that includes
1028 continuous and comprehensive anytime, anywhere training that evolves with, and
1029 accommodates all educators' needs and educational environments.

1030

1031 *Target Tech:* Is the desired level for every district and school to achieve and is further
1032 articulated in Appendix IV: CEO Forum School Technology and Readiness (STaR) Chart.
1033 Elements in the chart are used throughout the plan as suggested measures of progress.

1034

1035 *Technology integration*: Technology is seamlessly integrated into school culture,
1036 management, pedagogy, curriculum, instruction, and assessment. Effective and appropriate
1037 integration of technology is part of a planned program of school improvement as it relates to
1038 school management and student achievement of the State Academic Content Standards.

1039

1040 *Technology Integration Performance Index (TIPI)*: An index of multiple measures that
1041 describes the learning environment for students and educators, and represents an objective

1042	standard of the level of technology integration that all districts and schools should achieve.
1043	(See Appendix II.)
1044	
1045	*Technology literacy*: The ability to use technology to improve student achievement, and the
1046	capability to think critically about the use and integration of technology in teaching and
1047	learning. ISTE NETS standards describe the technology skills and knowledge students
1048	should acquire as they progress through the K-12 system and is further articulated in
1049	Appendix VI: ISTE NETS.
1050	
1051	*Total Cost of Ownership:* A model that incorporates all aspects of technology costs and
1052	includes, technical support, professional development, maintenance, replacement, recycling,
1053	and disposal.
1054	
1055	*Ubiquitous access*: Is the availability of all resources necessary to utilize technology for
1056	teaching, learning, and school management, anytime, anywhere. It includes access to
1057	hardware, software, online resources, digital content, curriculum, assessment, and technical
1058	support. Ubiquitous access will ensure that student and educator work is neither impeded,
1059	nor restricted to the school or district site.
1060	
1061	

Appendix II: Technology Integration Performance Index (TIPI)

1061

1062

1063 The Technology Integration Performance Index (TIPI) of multiple measures, describing a
1064 learning environment for students and educators, should represent an objective standard on the
1065 level of technology integration that all districts and schools should achieve. The TIPI should be
1066 collected and published in the Annual School Accountability Report and should be considered a
1067 parallel index to the API.
1068

1069 The TIPI will measure the Target Tech levels of every district and school and will assist in
1070 mapping the progress of educational technology integration throughout California. Policymakers
1071 and educators will be able to use the TIPI to make better-informed decisions regarding the
1072 allocation of resources and the primacy of legislation needed to improve educational technology
1073 integration. The TIPI will assist parents, community members and other education partners to
1074 develop high quality partnerships that address local educational technology needs and priorities.
1075

1076 The Commission on Technology and Learning (CTL) recommends that the State study, identify
1077 and determine the multiple measures and their relative value for inclusion in the TIPI. While the
1078 Commission has not focused on the TIPI in depth, there has been consensus that the Index
1079 should measure the levels of ubiquitous access, educational technology, and technology
1080 integration, along the dimensions of curriculum, instruction, and assessment; professional
1081 development; and infrastructure at every school and district site throughout California. In other
1082 words, the TIPI should capture the breadth and the depth of the *Closing the Gaps Matrix* in the
1083 Executive Summary (see page --).
1084

1085 The Commission recommends that the State utilize those data elements already collected by state
1086 agencies, districts, and schools, and determine their relative value for inclusion in the TIPI.
1087 Additionally, the Technology in Schools Task Force developed a guide to assist those assessing
1088 technology in education through the National Cooperative Education Statistics System and
1089 funded by the National Center for Education Statistics (NCES) of the U.S. Department of
1090 Education. The Commission strongly recommends that the State review the findings of the
1091 Technology in Schools Task Force to develop the TIPI, including their report, *Technology in*
1092 *Schools: Suggestions, Tools, and Guidelines for Assessing Technology in Elementary and*
1093 *Secondary Education*, and the list of comprehensive data elements, reproduced in Appendix III
1094 of this plan.

1095 **Appendix III: National Center for Education Statistics Technology in Schools:**
1096 **Suggestions, Tools, and Guidelines for Assessing Technology in Elementary**
1097 **and Secondary Education**
1098
1099 Appendix A2 from the above document published by the National Center for Education Statistics
1100 (NCES) contains a list of data elements to be reviewed for possible inclusion during the
1101 compilation of the TIPI. Refer to the website at http://nces.ed.gov/pubs2003/2003313.pdf.
1102
1103 **Appendix IV: CEO Forum K-12 School Technology and Readiness (STaR)**
1104 **and Teacher Preparation StaR Charts**
1105 http://www.ceoforum.org/starchart.cfm
1106
1107 **Appendix V: Information literacy skills/ Academic Content Standards**
1108 *Education Technology Planning: A Guide for School Districts:* Appendix B
1109 http://www.cde.ca.gov/ctl/edtechplan/appendixes.pdf
1110
1111 Academic Content Standards for California Public Schools
1112 http://www.cde.ca.gov/standards/
1113
1114 **Appendix VI: ISTE National Education Technology Standards (NETS)**
1115 http://cnets.iste.org/
1116

1116
Appendix VII: Current state-administered technology resources
1118

1119 **California Learning Resource Network (CLRN).** CLRN services include the review of
1120 supplemental electronic learning resources (including software, on-line resources, and
1121 video) and on-line model technology lessons for alignment with the State Board-adopted
1122 Academic Content Standards. The review criteria used in this process were approved by
1123 the State Board of Education. The goal is to provide a comprehensive instructional
1124 delivery package that combines standards-aligned resources and standards-based lesson
1125 plans in a single, easy-to-use access point. The searchable website includes the review
1126 results of the resource evaluation, the standards-based instructional lessons, and links to
1127 other resources. Refer to the website at http://www.clrn.org.

1128 **California Student Information System (CSIS).** CSIS builds the capacity of Local
1129 Education Agencies (LEAs) to implement and maintain comparable, effective, and
1130 efficient student information systems that supports local education agency (LEA) daily
1131 program needs and promotes the use of information for educational decision-making by
1132 school-site, district office and county staff. It enables the accurate and timely exchange of
1133 student transcripts between LEAs and post secondary institutions. CSIS assists LEAs with
1134 the transmittal of state reports electronically to the California Department of Education,
1135 thereby reducing reporting burden of LEA staff.

1136 **California Technology Assistance Project (CTAP).** CTAP works collaboratively with all
1137 school districts and county offices of education, through a network of eleven regions statewide,
1138 to meet locally defined technology-based needs. CTAP regional staff provide assistance in the
1139 areas of staff development; learning resources; hardware telecommunications infrastructure;
1140 technical assistance to school districts in developing a support system to operate and maintain an
1141 education technology infrastructure, including improving pupil record keeping and tracking
1142 related to pupil instruction; coordination with federal, state, and local programs consistent with
1143 State Board-adopted Academic Content Standards; and funding for technology. Refer to the
1144 website at http://www.cde.ca.gov/edtech/ctap.htm.
1145

1146 **Digital California Project (DCP).** DCP provides California's K-12 education community with
1147 access to the high speed, high bandwidth on-line network currently available to higher education.
1148 DCP is designed to build the necessary network infrastructure needed to provide districts with at
1149 least one access point in each county to the high-speed statewide network. Refer to the website
1150 at http://www.cenic.org/CDP.html.

1151 **Technical Support for Education Technology in Schools (TechSETS).** This project
1152 provides professional development and resources for technology staff. Services include
1153 identifying technology skills needed, along with appropriate professional development,
1154 arrayed in a user-friendly matrix; identifying cost effective sources of training aligned to
1155 the matrix of skills; providing resources and support for California school technologists
1156 through an online interactive helpdesk, and providing assistance for planning and installing
1157 technology infrastructures. Refer to the website at http://www.techsets.org.
1158

1158 **Technology Information Center for Administrative Leadership (TICAL).** TICAL
1159 provides assistance for district and site administrators by providing professional
1160 development focused on "digital school leadership" for educational administrators in the
1161 areas of: data-driven decision making, integrating technology into standards-based
1162 curriculum, technology planning, professional development needs of staff, financial
1163 planning for technology, and operations and maintenance. Professional development is
1164 conducted through a series of workshops provided by TICAL cadre members throughout
1165 the state. TICAL maintains a web portal that features hundreds of resources that have
1166 been reviewed and recommended by practicing administrators to assist with digital school
1167 leadership. The portal is frequently augmented with current content that provides just-in-
1168 time assistance for administrators and is also used as the dissemination vehicle for
1169 information on upcoming professional development workshops. Refer to the website at
1170 http://www.portical.org.

1171 **CTAP[2] Technology Assessment Profile**. CTAP[2] is an on-line, self-assessment data
1172 collection tool that allows school administrators to gather information on their staffs
1173 technology proficiency and use of technology for instruction. The website includes two
1174 administrative tools. The Proficiency Assessment is an on-line, self-assessment tool that
1175 allows educators to determine their level of technology proficiency. The self-assessment
1176 is based upon rubrics established in each area of technology competency and aligned with
1177 the California Commission on Teacher Credentialing (CTC) "Factors to Consider", which
1178 is the Technology Standard for a California K-12 Preliminary Teaching Credential. Based
1179 on the results of the assessment, educators can view and select training opportunities that
1180 will advance their proficiency. While the results for the individual teacher are private,
1181 charts can be displayed showing the overall level for teachers at a school site as well as
1182 within a district, county, region, or for the entire state. The Technology Use Survey is an
1183 on-line tool that allows site, district, county and state administrators to gather information
1184 regarding certificated staff's use of technology tools. The survey addresses four areas of
1185 teacher technology usage: 1) use of technology tools for classroom management and
1186 instruction; 2) their student's use of technology tools for classroom assignments; 3) their
1187 professional development preferences, and 4) their technical support experiences. Refer to
1188 the website at http://ctap2.iassessment.org.
1189
1190

1191
1192

Partial List of References:

- *Summary of Statewide Results for the 2001 California School Technology Survey*
- *Summary of Statewide Results for the 2002 California School Technology Survey*
- *Connecting California's Children—Is E-Rate Enough?* (released by the Latino Issues Forum). You can also find the Latino Issues Forum paper at www.lif.org.
- *Conditions for Classroom Technology Innovations*, byYong Zhao, etal.
- CEO Forum *School Technology and Readiness Report – Key Building Blocks for Student Achievement in the 21st Century*
- Ed Source: Developing CSIS
- Ed Source: California's Student Testing System
- Education Week-Technology Counts 2001
- "Research-based answers to the Professional Development Questions submitted by Commission on Technology in Learning," prepared by John Cradler, Educational Support Systems and Center for Applied Research in Educational Technology (CARET)
- *Designs for Learning*, Executive Summary.
- *Learning, Teaching, Leading: Report of the Professional Development Task Force*
- *National Education Standards for Teachers, Preparing Teachers to Use Technology.*
- *Final Reports for the Joint Committee to Develop a Master Plan for Education K-20*. These reports will not become an Education Master Plan until the Joint Committee decides how to handle the report recommendations. Available at: http://www.sen.ca.gov/ftp/SEN/COMMITTEE/JOINT/MASTER_PLAN/_home/whatsnew.htp
- The George Lucas Education Foundation, *Edutopia Online*. Available at: http://glef.org/
- "Missouri's ed-tech program is raising student achievement," article by Cara Branigan, Assistant Editor, eSchool News, March 13, 2002. Available at: http://eschoolnews.com/news/showStory.cfm?ArticleID=3588
- *Principal Training Program (AB 75).* Available at: http://www.cde.ca.gov/pd/prin/index.html
- *What's In, What's Out—An Analysis of State Educational Technology Plans*. Dr. Yong Zhao, Michigan State University
- *Survey of Existing Evaluations on the Impact of Education Technology on Teaching and Learning*, Cathy Ringstaff, Senior Research Associate, WestEd
- *The Power of the Internet for Learning: Moving from Promise to Practice. Report of the Web-based Education Commission to the President and the Congress of the United States*, **David Byer**
- Technology Briefs for *'No Child Left Behind'* Planners
  Available at http://www.neirtec.org/products/techbriefs/default.asp
  Note: Complete the online form and submit to access the PDF file
- State Policy Framework for Assessing Educational Technology Integration, Version Four by Chris Dede
  Available at http://www.neirtec.org/statepolicy
- PowerPoint on Total Cost of Ownership
  Available at http://www.cosn.org/tco/project_pubs.html

1236   •   Critical Path Analysis of California's Science and Technology System, April 2002.
1237   Available at http://www.ccst.ucr.edu/cpa/download/CPA_Full.pdf
1238   •   California Master Plan for Education – Kindergarten through University
1239   Available under the "documents" link at http://WWW.SEN.CA.GOV/masterplan/
1240   •   CEO Forum Report Year 4 Report, June 2001 - *Key Building Blocks for Student*
1241   *Achievement in the 21st Century* and STaR Chart
1242   Available at http://www.ceoforum.org/reports.cfm
1243   •   *Report of the Professional Development Task Force - Learning, Teaching, Leading.*
1244   *Presented by Jean Treiman at the May Commission Meeting*
1245   Available at www.cde.ca.gov/cdepress/learnteachlead.pdf
1246   •   *Connect, Compute, and Compete: The Report of the California Education Technology*
1247   *Task Force,* California Department Of Education, 1996
1248   •   *National Educational Technology Standards for Students. Connecting Curriculum and*
1249   *Technology,* International Society for Technology in Education, USDOE, 2000
1250   •   *National Educational Technology Standards for Teachers. Preparing Teachers to Use*
1251   *Technology,* International Society for Technology in Education, Teacherline, grant from
1252   USDOE, 2002
1253   •   U.S. Department of Education, National Center for Education Statistics. *Technology in*
1254   *Schools: Suggestions, Tools,* and *Guidelines for Assessing Technology in Elementary and*
1255   *Secondary Education*, NCES 2003–313, prepared by Tom Ogle, Morgan Branch,
1256   Bethann Canada, Oren Christmas, John Clement, Judith Fillion, Ed Goddard, N. Blair
1257   Loudat, Tom Purwin, Andy Rogers, Carl Schmitt, and Mike Vinson of the Technology in
1258   Schools Task Force, National Forum on Education Statistics. Washington, DC: 2002.
1259
1260